ZIN Technologies

Jan. Financial Review

Feb. 19, 2013

NASA GRC SpaceDOC

NASA GRC SpaceDOC

101 Fluids and Combustion Facility, MIP & TSC

ZIN Manager: **Michael Johanson**
ZIN Engineering Lead: M.O'Toole
ZIN Operations Lead: T. Wasserbauer
ZIN Integration Lead: C. Rogers

NASA Program Manager: Tom St'Onge
NASA Project Manager: Bob Corban (Kevin McPherson)

SpaceDOC 101 encompasses the International Space Station (ISS) Fluids and Combustion Facility (FCF) Project and its initial payloads, Light Microscopy Module (LMM) and the Multi-user Droplet Combustion Apparatus (MDCA) have been launched and the flight units are installed on the ISS. The Flight units on the ISS, as well as the units on the ground (Ground Integration Units and the Engineering Development Units) need to be operated and maintained. This Delivery Order is for the operation of the FCF racks on orbit and on the ground, resolution of any anomalies, evaluation of trends, software upgrades, hardware obsolescence evaluation, new hardware development to support future capabilities, verification, and training the crew and operators on the hardware/software. Also, as new payloads are developed for the FCF, analytical modeling and engineering analysis of the interface will be required.

The CIR Flight Unit, along with MDCA, was delivered to the ISS by STS-126 (November 2008). The FIR Flight Unit along with the LMM were delivered to the ISS by STS-128 (August 2009).

Issues and Concerns

101 Fluids and Combustion Facility, MIP, TSC, LMM, MDCA

Issue	Potential Impact	Action Plan	Resolution Date
HRDL/Rack Lock –ups	Loss of HRDL downlink capability	Develop software patch that eliminates HRDLOS disk writes to /sd0. This resolves the root cause of the file allocation table conflict Procedure work-around implemented successfully to allow operations	**March**

Monthly FCF Highlights

- FLEX Science
  - Resumed FLEX Science with the CO@ Diluent Exchange Matrix
  - Completed and down-linked 15 test ignitions
- ACE Science
  - Initiated FIR IDD update to document LMM microscope interfaces
  - Draft version of ACE camera upgrade procurement specification
- Safety
  - HTV-4 manifest SDP to PSRP
  - GCIP SDP to GRC
  - Baselined GCIP Fracture Control Summary Report
- Software
  - Conducted ERB for s/w modification to address HRDL File allocation Table conflict
  - Supported Engineering Review Board for release of the LMM software modification ACE-M-1
- Integration
  - Coordinated LMM GIU – Supported CVB PI
  - Coordinated SAR, bench review and shipment of hardware for ATV4 (FLEX, CVB, ACE, CLSM)
- Hardware deliverables
  - Submitted POs for cable flight spare
  - Submitted POs for FOMA filter flight spare
  - Completed EMI test of IPSU flight spare
  - Completed EMI Test of MDCA Color Camera
- IPSU-G
  - Submitted POs for development h/w system and EM HRDL processor interface
  - Drafted version of IPSU-G specification

2013 Deliverables List

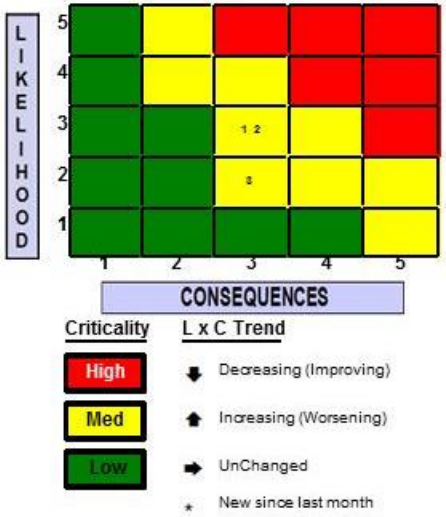
101 Fluids and Combustion Facility, MIP, TSC, LMM, MDCA

Deliverable	Planned	Actual	Note
GCIP flight unit	Mar-2013		Assembly and test completed. Verifications in process, delivery for HTV-4
MDCA Avionics Package spare	Apr-2013		Assembly and test completed. Final GIU functional validation planned in March
LMM Control Box spare (No Environmental)	Apr-2013		Out of plan board vibe required. Assembly complete scheduled April
QD Lubrication Kit (if required)	Jul-2013		Concept coordinated with ISS Qdirt. Final design pending program feedback
IPSU spare - Remora	Sep-2012		Assembly complete EMI test completed January, Vibe planned Feb
MDCA Color Camera spare	Nov-2012		EMI test completed January, Vibe planned Feb
IPSU Analog repair (SN 2001)	Apr-2013		
WFCA Controller (2)	Oct-2013		
FOMA Re-Circulation Pump	Nov-2013		
EPCU Rack Power Switch	Dec-2013		
IRR GC Filter (3)	May-2013		
IRR Vent Filter (3)	June-2013		
Spare Cables (7)	Sept-2013		
Spare Hoses (4)	July-2013		
GC Manifold Test Unit	Nov-2013		

NASA GRC SpaceDOC

Risk Matrix - FCF

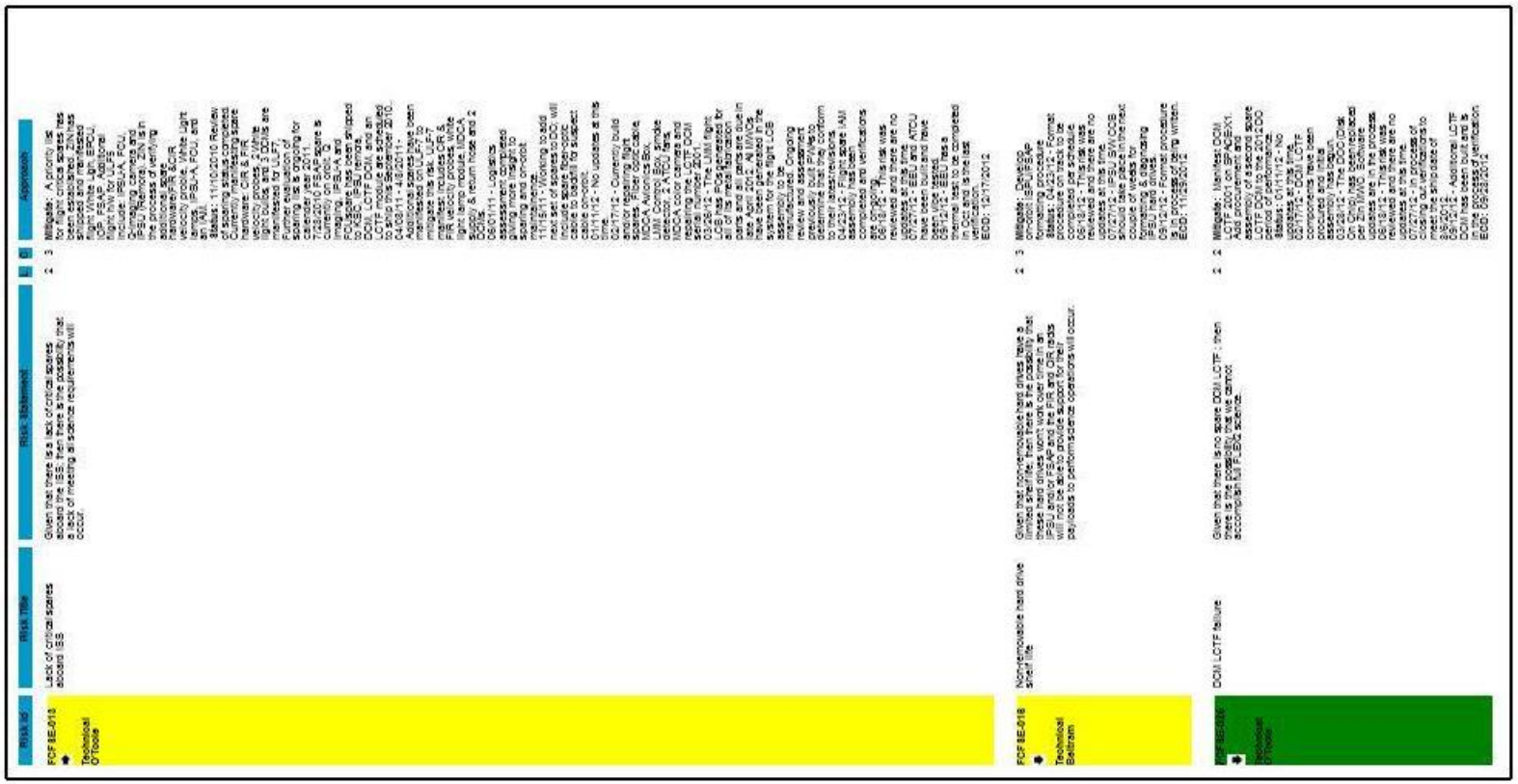
101 Fluids and Combustion Facility, MIP, TSC, LMM, MDCA



Risk Id	Risk Title	Risk Statement	L	C	Approach
FCFSE-026 ➡ Technical Beltram	LMM GIU does not fully emulate the flight unit	Given that the LMM GIU does not fully emulate the flight unit;; the possibility exists that future LMM flight experiments will not operate correctly.	3	3	**Mitigate:** Plan is to review LMM GIU non-flight design issues, and add task to update LMM GIU to the next DO period of performance. **Status:** 12/21/11 - Task has been added t the DO to upgrade to LMM GIU. 01/11/12 - No updates at this time. 02/17/12 - The LMM GIU has been assessed and the upgrades needed to emulate the flight system have been identified. Additionally, microscope motor functions are in the process of being repaired. 03/28/12 - Risk has been reviewed and there are no changes to its status at this time. 04/23/12 - Currently preparing trouble shoot procedures for LMM motor functions. 06/18/12 - This risk was reviewed and there are no updates at this time. 07/27/12 - Turret motor problem diagnosis has been completed and repair for it is in process. **ECD:** 07/02/2012
FCFSE-029 * Technical O'Toole	ICM failure	Given that the ICM may fail; then there will be a significant impact to the back lit imaging science instrument to occur.	3	3	**Mitigate:** Develop ICM spares. **Status:** **ECD:** 04/30/2013
FCFSE-014 ⬇ Technical Beltram	IOP removable hard drive shelf life	Given that the IOP removable hard drives have a limited shelf life; then there is the possibility that these hard drives won't work over time and the FIR and CIR racks will not be able to provide support for their payloads to perform science operations will occur.	2	3	**Mitigate:** Implement a procedure to re-format the hard drive on-orbit to minimize loss of magnetic field encoding data on the disk. **Status:** 04/23/12 - Currently on track for the development of the formatting procedure. 06/18/12 - This risk was reviewed and there are no updates at this time. 07/27/12 - Formatting being developed. 09/12/12 - Documented format procedure is in process of being developed. **ECD:** 08/30/2013

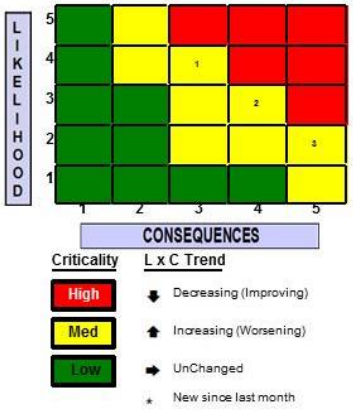
Risk Matrix - FCF

101 Fluids and Combustion Facility, MIP, TSC, LMM, MDCA



Risk Matrix - FCF

101 Fluids and Combustion Facility, MIP, TSC, LMM, MDCA

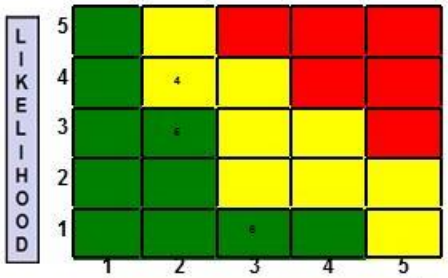


Risk Id	Risk Title	Risk Statement	L	C	Approach
MDCA-012 ➡ Technical O'Toole	FLEX-2J Droplet Size Repeatability	Given the tolerance on droplet reproducibility has not been demonstrated there is possibility that we will not meet the reproducibility requirement	4	3	**Mitigate:** Review science requirement with JAXA and determine the capability of the flight hardware to meet the science requirement. **Status:** 06/18/12 - Not started. S/W engineering resource not available as of 6/15/2012. Expected closure date is Aug 31, 2012. 09/12/12 - Awaiting for the revised MDCA S/W to complete the last mitigation task. **ECD:** 10/31/2012
MDCA-011 ➡ Technical O'Toole	FLEX-2J Deployment Validation	Given that we cannot verify multiple droplet deployments in a 1G environment there is possibility that not all science will be met	3	4	**Mitigate:** Develop a robust 1G validation program **Status:** 06/18/12 - Not started. S/W engineering resource not available as of 6/15/20102. 07/27/12 - S/W developer resource got a late start. 09/12/12 - Pusjhed out the first mitigation task by one month per monthly RMWG. **ECD:** 10/31/2012
MDCA-007 ➡ Cost O'Toole	Lack of on-orbit spare avionics box	Given that there is no flight spare MDCA avionics box on ISS and there are no plans or budget to build a flight or GIU MDCA avionics box; then there is the possibility that, if the MDCA avionics box becomes inoperable, a complete loss of the ability to obtain FLEX-2 science will occur.	2	5	**Mitigate:** A plan to build a flight spare avionics package is authorized under the current DO with delivery planned for the 4th quarter of 2011. **Status:** 08/24/11 - Still on schedule to deliver flight spare avionics box. 10/04/11 - The project is still targeting the flight spare avionics delivery in December of 2011. 11/15/11 - Delivery of the assembly is projected for February 1, 2012. Verification and manifest is expected to be included in the follow-on DO period of performance. 03/07/12 - Flightspare MDCA avionics box is in the process of being built per ZIN Tech MWO. 03/28/12 - Flightspare avionics box is tentatively scheduled for several environmental tests as follows: Vibe & EMI in May of 2012 and Thermal Cyale in June of 2012. 04/23/12 - Flightspare avionics box is in the process of being built. 06/18/12 - Assembly complete. Vibration and EMI testing Completed. Thermal Cycle testing scheduled for June 2012. **ECD:** 09/28/2012

NASA GRC SpaceDOC

Risk Matrix - FCF

101 Fluids and Combustion Facility, MIP, TSC, LMM, MDCA

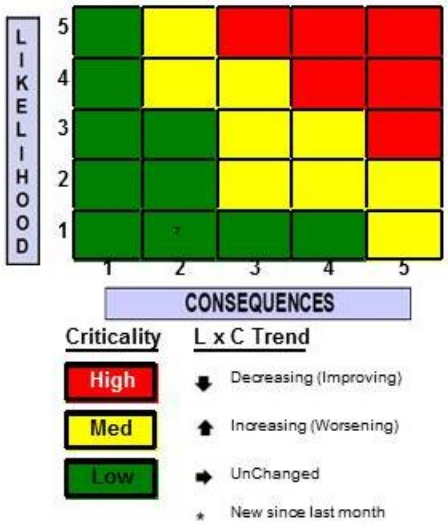


Criticality	L x C Trend
High	Decreasing (Improving)
Med	Increasing (Worsening)
Low	UnChanged
	New since last month

Risk Id	Risk Title	Risk Statement	L	C	Approach
MDCA-013 ➡ Technical O'Toole	FLEX-2J Droplet Imaging Resolution	Given that the there is limited performance data for the droplet imaging camera at 60 frames per second there is possibility that we will not meet the resolution requirement	4	2	**Mitigate:** Review science requirement with JAXA and determine CIR h/w capability. **Status:** 06/18/12 - Resolution test pending 60 fps camera configuration. Initial attempt to operated at 60 fps failed. Expected closure date is Aug 31, 2012 per O'Toole's e-mail Friday 6/15/2012. 09/12/12 - Demonstrated that there is a 60 fps capability. The resolution test still needs to be done. **ECD:** 08/31/2012
MDCA-010 ➡ Schedule O'Toole	FLEX-2J SRD not signed	Given that the FLEX2J SRD is not signed at PDR there is a risk that project cost and schedule will not be met.	3	2	**Mitigate:** Document requirements as understood via previous TIMs and coordinate with JAXA to obtain concurrence **Status:** 06/18/12 - Reviewed updated draft document with JAXA rep. Signature parties identified per O'Toole's e-mail Friday 6/15/2012.. 07/27/12 - FLEX-2J is still in work by the PI. Latest JAXA comments have been incorporated into the SRD. 09/12/12 - GRC Science, JAXA Science, as well as GRC Project management & Zin Engineering have all signed off on SRD. Awaiting for NASA HQ to sign off and approve. **ECD:** 09/28/2012
MDCA-014 ➡ Technical O'Toole	ICE-GA combustion by-products	Given that the hexanol combustion by-products are not established there is the possibility that the ICE-GA hexanol fuel may not be allowed on ISS.	1	3	**Mitigate:** The project intends to perform by-product testing on hexanol to show it is compatible with ISS vents requirements and meets toxicity limits. **Status:** 09/12/12 - Test has been initiated. **ECD:** 10/31/2012

Risk Matrix - FCF

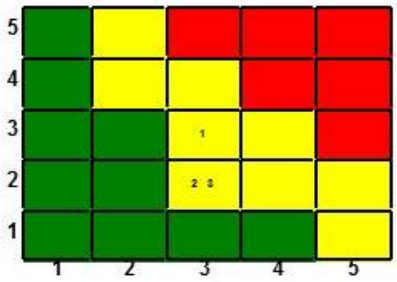
101 Fluids and Combustion Facility, MIP, TSC, LMM, MDCA



Risk Id	Risk Title	Risk Statement	L	C	Approach
MDCA-015 ➡ Schedule OToole	Unapproved ICE-GA Science Requirements Document	Given that the ICE-GA SRD is not signed at PDR there is a risk that project cost and schedule will not be met.	1	2	**Mitigate:** Get the SRD signed by both Italians and Project. **Status:** **ECD:** 09/28/2012

Risk Matrix - FCF

101 Fluids and Combustion Facility, MIP, TSC, LMM, MDCA



Criticality

- High
- Med
- Low

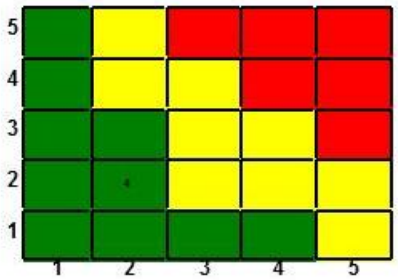
L x C Trend

- Decreasing (Improving)
- Increasing (Worsening)
- UnChanged
- New since last month

Risk Id	Risk Title	Risk Statement	L	C	Approach
TSC-004 Cost	Lack of support depth	Given that there is no more than 1 subject matter expert in the areas of TSC System administration, FCF Ground software, and FCF data post-processing, there is a risk that FCF will not be supported adequately to ensure mission success.	3	3	Status: ECD: 12/28/2012
TSC-002 Technical	DICES III voice loop system obsolete	Given that DICES III system hardware is at end-of-life, there is a risk that voice loop services will not be available to support mission operations.	2	3	Status: ECD: 12/28/2012
TSC-003 Technical	Video System Difficult to Support	Given that the Grass Valley video matrix and AMX video switch system uses an unmaintainable and undocumented configuration, there is a risk that all video channels may not be available to support mission operations.	2	3	Status: ECD: 12/28/2012

Risk Matrix - FCF

101 Fluids and Combustion Facility, MIP, TSC, LMM, MDCA



Criticality	L x C Trend
High	Decreasing (Improving)
Med	Increasing (Worsening)
Low	UnChanged
	New since last month

Risk Id	Risk Title	Risk Statement	L	C	Approach
TSC-001 Technical	Stale TSC documentation and not up to date	Given that documentation has not been updated as physical changes are made at the TSC, there is a risk that troubleshooting and maintenance will not be properly performed.	2	2	Status: ECD: 12/28/2012

102 Acceleration Measurement Program (AMP)

Engineering Lead Jennifer Keller & Ray Pavlik

NASA Program Manager: Tom St. Onge
NASA Project Lead: Kevin McPherson / Bob Hawersaat

SAMS Objective:
- Provide acceleration measurement systems that meet the requirements of the researchers on board the International Space Station.
- SAMS measures the acceleration environment in the 0.01 to 400 Hz range for payloads.

MAMS Objective:
- Provide acceleration measurement system that measures the Quasi steady and vibratory acceleration data in the 0.00001 to 100 Hz frequency range on board the International Space Station (ISS) vehicle

PIMS Objective:
- Provide acceleration measurement data to Principal investigators who conduct scientific research on board the International Space Station.
- The SAMS acceleration measurement system provides the raw data that PIMS uses to provide analysis to the Principal Investigators. SAMS measures the acceleration environment in the 0.01 to 400 Hz range for payloads.

Milestone Schedule

102 AMP (SAMS, MAMS, PIMS)

WBS	Milestone	Start	Baseline	Projected	Actual	Schedule Variance
1.8.9	SE Cable – at least 144 inches in length	7/12		12/12	1/13	Delivered for ATV4 launch
1.8.10	Spare TSH-ES	7/12		12/12	1/13	Delivered S/N 03 for ATV4 launch
1.8.10	TSH-ES 08	1/13		12/13		

Issues and Concerns

102 AMP (SAMS, MAMS, PIMS)

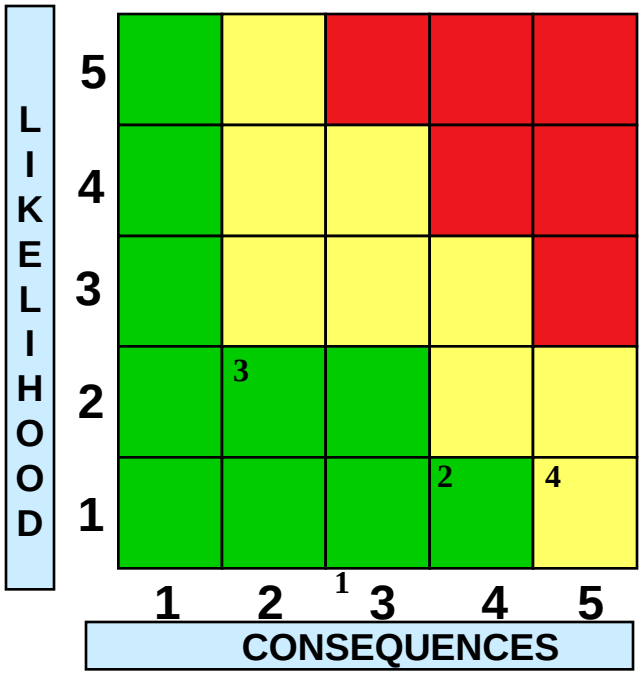
Issue	Potential Impact	Action Plan	Resolution Date
Network issues onboard delaying EE-F05 boot process	EE-F05 not booting	Work with DMC to help determine network issues.	Moved sensor back to EE-F05 and the network troubles have not appeared as of late. Continue to work with Express if/when it does occur.
Crew office cannot properly torque the SAMS MSG baseplate into the MSG WV	Not a good surface mount for the SAMS TSH-ES	1. ECO the SAMS AIDD to call out the torque values for the baseplate 2. Request in writing the issue and why it cannot be performed.	9/15/09 – telecon held with MSG. It was decided that the fasteners on the SAMS baseplate for the TSH-ES will not be torqued. Integrated Safety Hazards are being updated on the MSG side, and SAMS is clarifying a SAMS safety hazard. TSH installed in MSG and working with SODI. Crew procedures said to be hand tight.
TSH-ES S/N 08 failed the failed the SAMS TSH-ES Functional Acceptance Test	TSH-ES S/N 08 will not fly on ATV-4	1. Work the NCR SAMS-NCR-271	April 2013

Monthly Highlights
102 AMP (SAMS, MAMS, PIMS)

- SAR1/SAR2 for ATV4 (TSH-ES S/N 03, MSG cable and baseplate, and New 10m cable) on 1/23/13
- Software Upgrade Status
  - Ported SAMS ICU software to Ubuntu 12.04 system
  - Setup GSE rack w/sams-cu laptop
  - Installed and setup Ubuntu 12.04 OS on CU laptop
  - Worked on BOOTP/TFTP + NFS setup for new laptop for EE communication
- 2013-01-28 Telecon with JAXA's MMA team regarding future collaboration and for concerns about sleep-period disturbances of Marangoni experiment in the JEM.
- Provided analysis for verification of ZBOT microgravity requirements.
- Ops
  - SAMS Filter cleaning on 1/23/13
- TSH-ES 08 troubleshooting plan being generated for NCR-271

Top Risks

102 AMP (SAMS, MAMS, PIMS)



Criticality	LxC Trend	Approach
High	Decreasing	**M**-Mitigate
Med	Increasing	**W**-Watch
Low	Unchanged	**A**-Accept
	New	**R**-Research

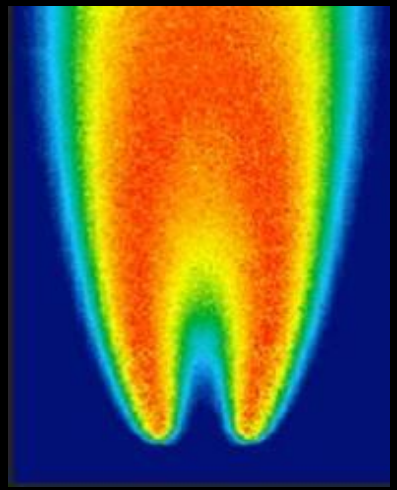
Approaches: Mitigate, Watch, Accept, Research

Risk ID	Risk Title	Risk Statement	L	C	Approach
DO102-1	TSH-ES wire size	Wire sizing could limit usage of the TSH-ES. The use of 12 gauge wire would increase the size of the TSH. Many power suppliers have 20 amp breakers.	1	2	**Watch**: Will address risk with inline breakers if a customer requires it. Not a problem for FIR or CIR. **Status**: Does not affect FCF or MSG. Will address when there is a user. **Close date**: Future User
DO102-2	Commanding Issue	NCR 237 identified: The laptop may lockup when commanding to the TSH-ES that is running at 400 Hz.	2	3	**Watch**: The system will need to be rebooted only. Alternative means to adduress this issue in future software builds will be considered. 400 Hz mode not a normal operating mode. **Status**: Waiting for funds to consider s/w fix **Close date**: On going
DO102-3	SAMS Sparing	SAMS PCS hardware not supported by the ISS program.	3	2	**Mitigate**: Ghosting function for hard drives in place. Laptop shells, spare hard drives and floppy drives have been set aside on ISS for SAMS use. **Status**: Need to configure one more set of spare hard drives **Close date**: 04/09
DO102-4	SAMS Fan Regulator	SAMS RTS Drawer #2 fan regulator frequency varies	2	4	**Watch**: Fan speed has shown the variable frequency for several months and has not shown any distinct changes in behavior over that period of time. **Status**: Need to configure one more set of spare hard drives **Close date**: 04/09

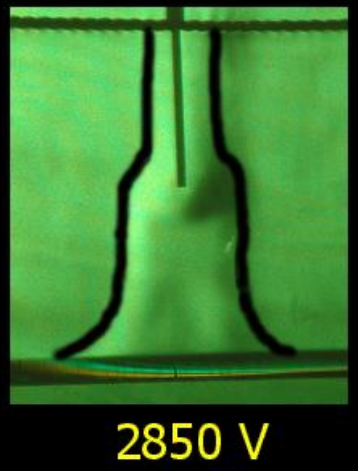
110 Advanced Combustion via Microgravity Experiments (ACME)

s-Flame
(drop test)

Flame Design
(drop test)



CLD Flame
(aircraft test)



E-FIELD Flames
(1g schlieren)

Manager: Brian Borowski

NASA Program Manager: Tom St. Onge
NASA Project Lead: Mark Hickman
NASA Project Scientist: Dennis Stocker

SpaceDOC 110 encompasses the initial development phase of ACME including requirements and verification development and planning, flow system breadboard interface with existing FOMA breadboard and color camera trade studies to ultimately provide a new diagnostic capability for CIR. Work on Engineering Model design is included following completion of Preliminary Design Review in January of 2011.

Issues and Concerns

110 Advanced Combustion via Microgravity Experiments

Issues	Potential Impact	Action Plan	Resolution Date
There are some requests to the project from the Project Scientist to change Science Requirements	If these changes are approved the ACME budget and schedule will be impacted. The longer the decision process takes, the more severe the impact will be as the flight design continues moving forward	A review panel was convened by NASA Project Management to discuss the potential changes. Actions were distributed to help make a determination	?
Following functional testing of the E-Field Subsystem and EMI testing of the same subsystem some requirement compliance issues have arisen with regard to energy levels	Unable to meet science requirements	Review Board has been convened to further discuss and provide guidance to management	12/12

Monthly ACME Highlights

- Continued build of EM Avionics Package
- Continued build of Flight Avionics Package
- Met project milestone for January with the completion of the build of a mass flow controller assembly
- Build of an EM Radiometer Assembly is underway
- Build of EM Zoom Lens Assembly is underway
- Redesign of igniter sub-system and mass flow controller assemblies has begun. Both are resulting from testing of the sub-assemblies and do not result in major rework of what has been completed.

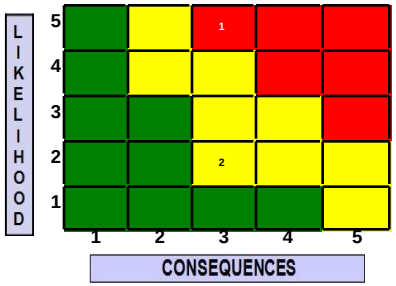
Milestone Schedule

110 Advanced Combustion via Microgravity Experiments

WBS	Milestone FY12	Credit	Start	Baselined	Projected	Actual	Scheduled Variance
1.1	Interim Design Review	100% package complete	May 2012	June 2012		June 2012	

ACME

Task Level Risk Assessment



Criticality

- High
- Med
- Low

L x C Trend

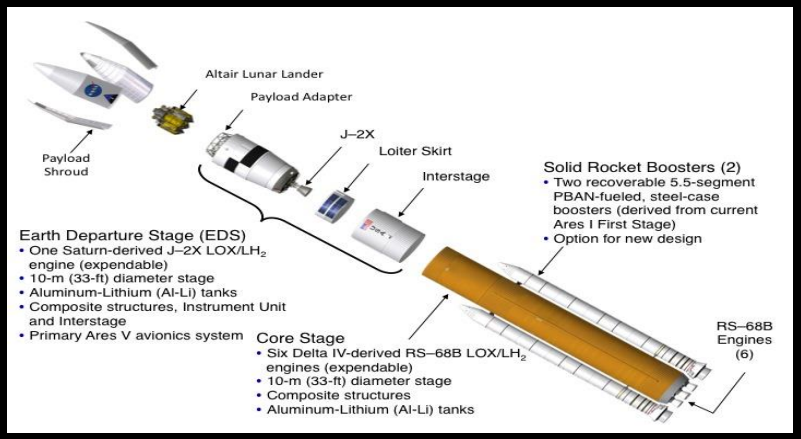
- Decreasing (Improving)
- Increasing (Worsening)
- UnChanged
- * New since last month

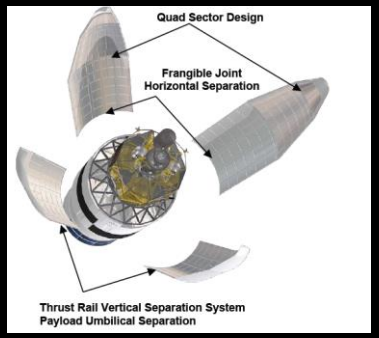
Risk Id	Risk Title	Risk Statement	L	C	Approach
ACME-014 Technical Rogers	IPSU to IOP image transfer rates take too long	Given that the current data transfer rates from the IPSU to the IOP is severely limited, transfer of ACME data may take an unacceptable amount of time and may reduce obtainable science for the allotted operational time on board ISS.	5	3	**Watch:** Need to keep an eye on this and follow up with the CIR team to keep updated on transfer improvements. **Status:** 12/13/11 - The FCF team has improved transfer rates by utilizing both IOP hard drives. The FCF team needs to provide quantitative data transfer rates. 03/27/12 - Risk reviewed by the ACME team and no staus updates at this time. 05/08/12 - ACME RMWG has reviewed this risk and there are no updates at this time. 06/12/12 - Risk was reviewed at the monthly ACME RMWG and there are no updates at this time. 07/27/12 - Negotiations to fund an IPSU upgrade with increased data transfer rates has been intiated. 09/12/12 - Currently the IPSU to IOP transfer rate is approx 1.3 Mbps. The IPSU redesign concept calls for a direct downlink from the IPSU directly to ground with ISS downlink capability at 20Mbps. FCF project is submitting a funding request to support development of the concept. 09/18/12 - ACME needs a minimum of 10 Mbps. 10/16/12 - This was reviewed in the monthly RMWG with nothing new to report. 11/20/12 - The FCF NASA PM has obtained funding for a new IPSU design with the ACME data transfer rates as part of the design criteria. **ECD:** 12/31/2012
ACME-008 Technical Gobeli	E-field emission exceedences	Given that there might be e-field exceedence emissions; then there is the possibility that the EMI requirement will not be met and ACME hardware would be adversely effected causing diminished science to occur.	2	3	**Mitigate:** The ACME team will be intensively working with the EMI lab to determine what if any EMI exceedences occur to meet its EMI requirement and minimize any impact on the hardware. **Status:** 1/11/11 Planned testing has been delayed due to funding. 11/23/10 No changes or updates at this time. 9/14/2010 No changes or updates at this time. 05/03/11 - 5/3/2011 - This risk will be on hold until the Engineering Model is completed. 05/31/11 - 5/31/11 - Nothing new to report. 02/14/12 - Still appear to be on target for test date. 06/12/12 - EMI testing has begun and should be completed by the end of June 2012. 08/21/12 - EMI report # GRC-EMI-RPT-331 has been written. 09/18/12 - ACME Project Scientist is in discussions with

119 Ares V Payload Shroud Element (PSE) Project

ZIN Manager: **Michael Johanson**
ZIN Engineering Lead: Bill Dial

NASA Project Manager: Gerry Sadler





SpaceDOC 119 encompasses evaluation of potential manufacturing approaches focusing on the Heavy Lift Payload Shroud but not be limited to (e.g. can include other element composite dry structures). Approaches may include: existing composite manufacturing sites, MAF, and new sites. ZIN and our subcontractor Zero Point will identify needed composite manufacturing assets and capabilities to support current Heavy Lift Vehicle concept and associated requirements based on manufacturing assessments done by the NASA ESMD ACT project. The scope of the analysis shall include logistics and supply chain requirements.

Issues and Concerns

119 Ares V Payload Shroud Element (PSE) Project

Issue	Potential Impact	Action Plan	Resolution Date
None			

Monthly PSE Highlights

- Continued to work Shroud Structural Analysis and Design task.
- A no cost extension was implemented extending the POP to 3/31/2012.

Milestone Schedule
119 Ares V Payload Shroud Element (PSE) Project

Milestone (Cal 10)	Baseline (Cal 10)	Projected	Actual	Schedule Variance
Payload Shroud Technology Development Plan	November 30, 2010	Nov 30, 2010	Nov 30, 2010	None
Preliminary Element Integration Assessment Report	January 15, 2011	Jan 15, 2011	Jan15, 2011	None
Manufacturing Implementation Plan	February 15, 2011	Feb 15, 2011	Feb 15, 2011	None
Final Element Integration Assessment Report	March 25, 2011	April 25, 2011	April 25, 2011	1 month no cost extension approved by Gerry Sadler
Provide a Basis of Estimate Bottoms Up Assessment of the Current SLS Shroud for metallic and composite 8.4 meter baselines.	June 6, 2011	June 6, 2011	June 6, 2011	None
Assessment of CPS Impacts on Payload Shroud	September 30, 2011	Sept 30, 2011	Oct. 13, 2011	Delivery slipped based on stop work due to lack of funding, slip was approved by Gerry Sadler
Fairing Basis of Estimate Updates 1. PPBE13 Update 2. Initial PPBE14 Update 3. Final PPBE14 Update	1. Oct. 30, 2011 2. May 30, 2012 3. Sep 30, 2012	1. Oct. 30, 2011 2. May 30, 2012 3. Sep 30, 2012	Dec. 12, 2012	The PPBE schedule is determined by NASA and the dates of the deliverables are subject to change.
Analysis and Design Reports 1. SRR 2. SDR	1. Oct. 1, 2011 2. Feb 1, 2012	1. Feb 1, 2012 2. Feb 1, 2012	Oct. 4, 2012	SLS SRR & SDR are NASA determined dates. They are currently planned to be combined and held Feb. 15, 2012.
Payload Fairing Evaluation: Test Plans and Procedures	15 day prior to testing		N/A	Work is de-scoped
Delta IV Stage Integration Assessment	Jan 31, 2012	Jan. 31, 2012	N/A	Work is de-scoped

Risk Matrix - PSE

119 Ares V Payload Shroud Element (PSE) Project

Study Delivery Order – No risks

DO-128 Communications, Navigation, and Networking Reconfigurable Testbed (CoNNeCT-2)

ZIN Project Lead: Ray Pavlik
ZIN Software Lead: Jennifer Keller

NASA Project Manager: Diane Malarik
NASA Deputy Project Manager: Mike Zernic
NASA GRC PI: Rich Reinhart
NASA GRC Deputy PI: Sandy Johnson

- An on-orbit, adaptable, Software Defined Radios (SDR)/Space Telecommunications Radio System (STRS)-based testbed facility to conduct a suite of experiments to advance technologies, reduce risk, and enable future mission capabilities on the International Space Station (ISS).
- DO-128 Scope of Work includes:
  - Performing configuration management activities, including software.
  - Remaining development of the CoNNeCT Flight and Ground System Software.
  - Integration with the Payload Operations Integration Center (POIC) and SCaN-provided SN, NEN, and NISN.
  - Sustaining Engineering and Operations of the Flight and Ground System.
  - Experiment Integration and Operation

DO-128 Issues and Concerns

Issue	Potential Impact	Action Plan	Resolution Date
None			

DO-128 Monthly Highlights

- Subtask A CM/DM
  - Reviewed, formatted, and released multiple Documents, Process Plans, Change Requests, and NCRs.
  - Supported GIU drawing updates.
  - Processed for storage as-run Mission Operations Procedures and GIU documents.
  - Completed what was to be the final build & release of the first post ship software upload, which was then held for a decision on whether the JPL Heartbeat updates should be included. The decision was made to include JPL Heartbeat updates in this release.
  - Reviewing and update the Software CM Plan, including a new SCR form and workflow, and review board process.
- Subtask B SE&I, Software, and Experiment Integration
  - GIU Maintenance (GRC-CONN-PLAN-0895) - Downloaded Avionics Files on a weekly basis.
  - JPL GSE I/F for the GIU – Installation and testing was completed.
  - GIU TWTA Pre Amplifier - Drawings are in checking.
  - GIU GPS Testing.
    - Generated MWO and Process Plan for Antenna Replacement.
    - Replaced Hat Coupler Antennas and ran Network Analyzer Scans. Signals for all three GPS Frequencies are now within a few DB of each other.
  - Configured all GIU test bed computers, TSIM's, TEI's, DAS's and DAS archival system to be synchronized with the GPS Master Clock reference.

DO-128 Monthly Highlights

- Subtask B SE&I, Software, and Experiment Integration (continued)
  - Commissioning Testing at WSC
    - Design, build and test interface panel for connection between the White Sands equipment and GRC supplied RF test equipment. After the system was tested, GRC learned the set-up that would be used was not as originally told. The system was re-designed, modified and re-tested.
    - All equipment that was to be used during commissioning was assembled as two complete systems and tested as a complete system.
  - Experiment 8
    - Conducted an initial experiment integration overview discussion with Don Stephens of CommLargo, the PI for Experiment 8. The PI was given a demonstration of the GIU and the EM JPL SDR.
  - Experiment 4
    - As a result of investigating how to display telemetry for the JPL GPS experiment, an issue was identified with how the current PAS software passes the JPL SDR OE Heartbeat telemetry to the ground.
    - The current PAS only parses telemetry fields which have data, rather than providing for the full packet. The JPL GPS experiment was counting on this as a means to bring down GPS-unique telemetry.
    - The software team made a priority of accepting a CR to add this feature prior to start of SW V&V testing.
    - Supported a visit by the Experiment 4 PI, David Robison. Conducted development testing of a new JPL GPS waveform on the GIU.
    - Worked with the Experiment 4 PI, David Robison, to develop a draft experiment integration schedule. The PI will now validate the dates and task durations.
    - Scheduled/conducted an experiment briefing for Experiment 4. Several of the PI requirements will need to be assessed by the project team for feasibility, including multi-day continuous experiment operations.
    - Conducted additional testing of new JPL GPS waveform to collected diagnostic files to be used in assessing issues noted with the CTADS command acknowledgement response which appeared to be failing during the recent PI tests.

DO-128 Monthly Highlights

- Subtask B SE&I, Software, and Experiment Integration (continued)
  - Continued researching and documenting the installed polar orientation of the flight antennas. An informal memorandum is being developed to track the information for future use. At this time JPL has expressed interest in the information for some of their experiments.
  - Ground Software
    - Worked on CRs for CTADS and CESDB updates.
    - Worked on the Store Telemetry And Retrieval System (STARS) requirements and design description
  - Flight Software
    - Implemented rough design of SW tracking in Redmine and began investigating Redmine upgrade.
    - CR0696 - JPL OE Heartbeat Telemetry - Investigated, implemented change, created and submitted CR CONN-CR-0696, signed CR, tested & confirmed change on GIU with Steve Hall.
    - Continued work on the Avionics Experiment Interface User's Guide and software.
    - Generated a rough draft of Experiment 3 requirements document..
    - Passed STB SCB Gate #2 for Flight SW Post Ship Build #1.

- Subtask C Flight & Ground Software
  - As of FY2013, flight and ground software activities have transitioned to WBS 01-03.

DO-128 Monthly Highlights

- Subtask D Mission Operations
  - Completed the TCR inputs and submitted to PTG (ISS pointing).
  - Completed the TRK and XML configuration file inputs for the operational weeks.
  - Completed PFD (power flux density) class analysis for the operational weeks.
  - Prepared weekly PPM inputs and the weekly POIC Briefing. Worked with PPM, Prep-OC, and TCO to add SCAN Testbed activities to timeline and make adjustments based on the granted SN/NEN events.
  - Prepared the scripts and procedures necessary for the operational weeks.
  - A CR to update GRC-CONN-OPS-0912 Mission Operations Modules was approved.
  - Continued with SFEP troubleshooting. Goddard is seeing the same issues on the spare that we do. The FSCC module is freezing. An update to the FSCC module driver did not work. GSFC preparing a new software build to address issues observed on the current build (LSIMSS 2.1).
  - The issue with the Harris and JPL forward link has been isolated to the low rate switch (JPL Port 277) at WSC. A temporary workaround is to use the GD Port. WSC will move us to a different port.
  - Completed GD SDR Pre-commissioning during Week 17.
  - Completed JPL Pre-commissioning during Week 18. Tested transfer of GPS files to Avionics through 1553 and SpaceWire.
  - Completed APS Commissioning during Week 18.
  - Provided TDRS-K with a real-time data sample from an APS Commissioning event to help them prepare for testing.

DO-128 Monthly Highlights

- Subtask D Mission Operations (continued)
  - Members of the Ops team attended a briefing about Expt #4A JPL GPS given by the PI David Robison.
  - Continued small scale changes to the LynxCAT SK toolbox. The tool was setup to allow the object models to be auto-loaded. In addition, a bug was detected for GMT days which have less than three digits. This effected to export of the TRK file names and has been corrected.
  - Completed the SCANTRAN data product for the experimenters to support spatial translation and rotation for all antennas and relevant coordinate systems. Review presentation was held and changes adopted. First cut overhead slides were delivered to Jim Lux.

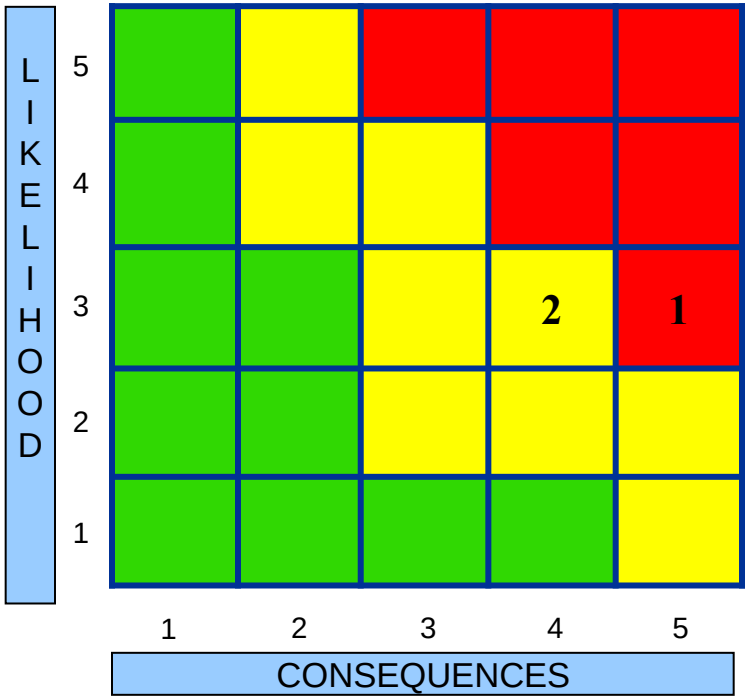
DO-128 2012 Deliverables List

Hardware/Software Deliverables CY 2013

No.	Item Description	Planned Completion Date	Actual Completion Date	Note
a)	Subtask A –CM/DM: Configuration Management and Tracking System (CMTS)	December 31, 2013		Hardware
b)	Subtask B – SE&I: First Verified Post-Ship Flight Software and subsequent upload to the Flight System	April 30,2013		Software
c)	Subtask B – SE&I: Verified Ground Software, suitable for use with First Post-Ship Flight Software	April 30,2013		Software
d)	Subtask B – SE&I: Second Verified Post-Ship Flight Software and subsequent upload to the Flight System	August 30, 2013		Software
e)	Subtask B – SE&I: Third Verified Post-Ship Flight Software and subsequent upload to the Flight System	November 30, 2013		Software
f)	Radio Frequency and Electronic Hardware Assemblies	December 31, 2013		Hardware

DO-128 Risk Matrix Overview

STATUS AS OF: 11/17/12



LxC Trend	Rank	Approach	Risk Title
➔	1	M	Underfunded Operations and Experiments Phase
➔	2	M	Experimenter Software Interface

Criticality

High

Med

Low

L x C Trend

- ↓ Decreasing (Improving)
- ↑ Increasing (Worsening)
- ➔ Unchanged
- N New

Approach

- M – Mitigate
- W – Watch
- A – Accept
- R – Research
- C – Closed